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ORIGINAL DEPARTMENT.

Communications.

Experiments by Vivisection to test the Value of the Diagnostic Symptoms of Certain Wounds of the Chest.

(An Inaugural Essay for the Degree of M. D., in the University of Pennsylvania.)

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The influence of the improvements in modern warfare has not only been shown in the changes of military tactics, but is also to be noted in the varied character of the injuries inflicted, and the modifications of surgical opinions that they have induced. Minnie rifles, rifled cannon, etc., now present a class of arms of a different character from those in use when Hennen, Guthrie, Larry, and others, wrote their works on military surgery, and the injuries inflicted by these modern projectiles are, consequently, also different from those formerly assigned to gun-shot wounds. Among the older surgeons, penetrating wounds of the chest were almost invariably described as being characterized by dyspnoea, hæmoptysis, passage of air at the wound, and collapse of the lung. These symptoms were detailed by Bell, Guthrie, Cooper, and others, and have been continued, with but little variation, to the present day; but surgery as well as the other branches of medical science has been gradually gathering new facts, and the opinions of surgeons are accordingly modified.

Without denying the correctness of the symptoms, under the circumstances, detailed by the above named surgeons, it would yet appear that the experience of those in charge of the Crimean hospitals was, in many points, different. Among these, the treatise of Sur-

geon Fraser,¹ if his opinions prove to be correct, is calculated to mark a new era, and as its contents were presented to me soon after its publication, and my attention directed to his experiments by my preceptor, Prof. Henry H. Smith, M. D., of the University of Pennsylvania, I have investigated his conclusions, and now, respectfully, and with diffidence, tender them to the consideration of the profession.

Premising that the passage of air from the wound, dyspnoea, emphysema, spitting or coughing up frothy blood, collapse of the lung, and later, pneumonia or pleurisy, or both, have hitherto been generally received as symptomatic of lung wounds, I propose to consider separately each of these symptoms, and show that Fraser is, probably quite correct in denying nearly all of them, or at least in receiving them under marked modifications of surgical doctrine. Fraser, after his investigations in the Crimea, and from experiments performed upon animals, arrived at the following conclusions.

1st. If the wound of the chest be small, there is little or no alteration in the movement of the lung, and the respiratory murmur is heard more or less on auscultation.

2d. When the opening in the thorax is larger than the glottis, the lung collapses sooner or later, the time of collapse being in proportion to the size of the opening.

3d. The thorax may be pierced by a cutting instrument or bullet obliquely or transversely without wounding the lung, therefore, two apertures is no proof of the lung being wounded.

¹A treatise upon penetrating wounds of the chest, by Patrick Fraser, M. D., London, 1859.

4th. Mechanical congestion of the lungs is often mistaken for the effects of inflammatory action.

5th. Simple opening of the pleural cavity, in animals, seems to produce little or no risk, and only very little inconvenience.

6th. That in the human subject, as well as in animals, an actual wound of the substance of the lung is always mortal, not from the effects of inflammatory action, but in recent cases, from the cessation of proper aeration, in either the whole or a portion of one or both lungs, or from sudden hæmorrhage. In investigating these conclusions separately, let us first see whether a wounded lung will collapse. This, undoubtedly, may be the case when there is an extensive opening, or it may result from the neglect of proper treatment; but it certainly is not a necessary consequence of penetration of the thoracic cavity, or of a wound of the lung. My experiments, based on those of Mr. Fraser, as well as the statistics of army surgeons show the correctness of this.

Experiment 1st. A large healthy cat was placed under the influence of ether, and a portion of the skin and muscles of the right side being reflected, a small opening was made into the pleural cavity, between the third and fourth ribs, one inch from the sternum. The lung did not collapse, nor was there any dyspnœa. The opening was then enlarged, when there was slight dyspnœa and the upper lobe of the lung partially collapsed. Air passed in on *inspiration* and out on *expiration*. The breathing being now allowed to continue twenty minutes, the cat was killed and examined, when no wound could be found in the lung on inflating it with air. The above experiment was repeated with the same result, and may be regarded as showing, that the lung will not collapse immediately, when the cavity of the chest is opened. It, however, also shows, that the lung will collapse in a time proportionate to the size of the opening, unless the effects of the wound be arrested by appropriate treatment.

Experiments, subsequently to be narrated, will also show, that the lung may be actually

wounded and not collapse. Adhesions of the lung to the costal pleura, it has been said, assist it, under such circumstances, to retain its position; but collapse does not always take place when no such adhesions can be found.

The question has been discussed, as having an important bearing on chest wounds, whether, in the normal condition, the pleura pulmonalis and the pleura costalis are always in immediate contact. If this be the case, it would be almost impossible for a pointed instrument to enter the chest without wounding the lung, which, we know, is contrary to experience. In connection with this point, I performed the following experiments.

Experiment 2d. A long cartilage knife was plunged two and a half inches into the right thoracic cavity of a healthy dog, between the fourth and fifth ribs. About three ounces of blood escaped. He showed no uneasiness at any time after the operation. There was no dyspnœa, and but slight passage of air at the wound. The respiratory murmur remained perfectly distinct, and there was never any sign of pneumonia or pleuritis. There was marked emphysema around the wound. In five days the dog was well.

As this dog was not killed and examined, it is impossible to say what injury was done internally; but I suspect, from the symptoms, that the lung was not wounded.

Experiment 3d. A long knife was passed into the right thoracic cavity of a large dog, between the fifth and sixth ribs. It entered near the sternum, and passed out just behind the angle of the ribs. Air entered and escaped on inspiration and expiration, but there was no dyspnœa. There was but slight bleeding, and when the wounds were closed the passage of air ceased. The respiratory murmur was heard on the left side, but was indistinct on the right. The next day the respiratory murmur was faintly heard on the right side, at the same time there was friction sound, with an occasional rattling. The dog was lively, and there was every evidence of a rapid recovery. Thirty-six hours after the operation the dog was killed, and on examination, a wound was found in the lower portion of the upper lobe

of the right lung. A small portion of the lung, around the wound was consolidated, which at that time entirely prevented the passage of air. The remainder of the lung was perfectly healthy, and presented the normal vesicular crepitation on pressure. No portion was collapsed. There was no emphysema of the lung, but there was slight emphysema of the cellular tissue, beneath the skin, which occurred, when the wound was inflicted. There was no inflammation of the pleura, except a small portion around the wound. There was slight effusion in the pleural cavity, but none to be of serious consequence.

Experiment 4th. A long knife was passed into the right thorax of a small dog, between the fifth and sixth ribs, near the sternum, and out near the spine. There was slight bleeding at both wounds. Air passed freely at the wound of entrance, until the wound was closed, when it ceased. There was no dyspnoea. The dog took food and was doing well. On the fifth day he was killed and examined. A wound, one inch in length, and nearly half an inch in depth, was found in the middle lobe of the right lung. The wound, however, had nearly healed, there having been adhesion except at a single point, and the congestion was reduced to a mere mark; but the wound was easily reproduced by dividing carefully the effused lymph. The lung was in the normal condition, there being no emphysema, pneumonia, or pleuritis. In these cases, the lung was wounded, it is true, but it could scarcely be otherwise, owing to the convexity of the walls of the chest. Had the lung been in immediate contact with the costal pleura, the wound must have been much more extensive, than it was in either case. The experiments of Fraser bear out this view of the case. It will be observed, that in these cases, there was no inflammation as a result of the wound; there was local congestion, but it did not involve the whole lung, nor even the entire lobe in which the wound was situated. The convexity of the diaphragm, pressing upward the lungs during expiration, must be considered, when examining a wound, that has been received low down in the thorax. The central

portion of the diaphragm rises as high, when in the erect posture, as the lower border of the second bone of the sternum; a wound, therefore, below this point, may be complicated with a wound of the diaphragm, or even of the abdominal viscera.

Experiment 5th. A dog was shot in the right side with a rifle bullet, which passed entirely through the body, and escaped from the opposite side. Blood escaped both from the wound of entrance and the wound of exit. There was no passage of air, but there was great nervous agitation, and some dyspnoea, which continued while the dog lived. He survived three hours. On examination it was found, that the ball had entered between the eighth and ninth ribs, fracturing the ninth. It passed through the diaphragm, wounded the liver, repassed the diaphragm, bruised, but did not enter the pericardium, skirted the lower lobe of the left lung, and passed out between the fifth and sixth ribs. The lung was congested but not lacerated. There was profuse hæmorrhage from the liver. In this case, there was more injury done to the abdominal viscera, than to the thoracic, notwithstanding the ball passed through the chest.

But to return to the position of the lung and its collapse, I believe, from the above experiments, and from the experiments and reported cases, given by Fraser, that the lungs are not always in immediate contact with the walls of the chest. This will explain many of the cases in which the lungs escape injury in penetrating wounds. In regard to collapses, we may conclude, from the above experiments, that it does not necessarily follow upon an opening being made into the pleural cavity. They also show that we may have actual lung wound without collapse; and, that when collapse does occur, it is in a time proportionate to the size of the opening. Collapse, however, is the natural result of the external air communicating with the cavity of the chest, and it will take place, sooner or later, unless the effects of the wound be counteracted, either by coagulated blood, or by appropriate treatment.

It has been stated by Houston, and also by Van Swieten, that in their experiments, they

observed the curious phenomenon, that when both sides of the chest were opened, the lungs instead of collapsing, thrust themselves forward as if to protrude at the wound. If this be the case, it is evident, that it cannot be the result of inflation of the lungs with air as in natural respiration. In connection with this point the following experiments were performed.

Experiment 6th. A large cat was placed under the influence of ether, and an opening made into the right thorax, so as to expose the lung without wounding it. The lung was seen to contract, or recede from the wound, on inspiration, and to approach the wound on expiration; but this approach was sudden as if the result of some spasmodic action. The lung finally collapsed. There was no dyspnoea until this took place.

Experiment 7th. A cat was etherized, and an opening made into the right thoracic cavity. The lung showed the same phenomenon as in experiment 6th. The left cavity was then opened, when both lungs collapsed. This experiment was repeated with the same result. In these cases, it will be observed, that when a single opening was made, the lung approached that opening on expiration, but when both sides were opened the lungs collapsed. Now, as stated above, this cannot be natural respiration, for it is evident the lung cannot be inflated during expiration; it, therefore, requires to be explained. Dr. Halliday, whose explanation is probably as correct as any given, says: "Should, however, the patient, in making an effort to expire, contract the glottis, the air contained in the lung of the sound side meeting with no resistance, will, by the communication of the branches of the trachea, expand the lung of the wounded side, so as to cause it to protrude at the wound." This is, no doubt, correct, when the glottis contracts, but it is observed when there is no contraction of the glottis; what is to explain it then? May not the rise and fall of the chest, together with the upward movement of the diaphragm, in the act of respiration, have something to do with it? We know, that when the breath is held for a time, the chest may be made to

rise and fall as in respiration. Now, when an opening is made into one side of the thorax, there is an equilibrium, as it were, established between the external air and the lung on the wounded side, and the lung will remain partially inactive, while the lung on the opposite side will continue to act, the chest will continue to rise and fall, the diaphragm will continue to ascend in expiration, and the lung and side of the chest must necessarily approach each other. Protrusion of both lungs I did not witness.

Dyspnoea.—When we remember the varied circumstances that may cause difficult breathing, we will at once see its fallibility as a sign of lung wound; nevertheless, it is one of the chain of symptoms, which must be considered in making out a diagnosis. Anything, that will prevent or retard the entrance of air into the air vesicles of the lungs, will cause dyspnoea, and the intensity of that dyspnoea will be in a degree proportionate to the obstruction to the entrance of air. This obstruction may be the result of different diseases of the lung, which cause consolidation, compression, or destruction of the lung tissue; or it may result from inability of the muscles of respiration to act; and finally, it may result from wound of the lung, and its consequent hemorrhage or collapse. In complete collapse of the lungs, air cannot enter their structure, respiration must cease, and the patient dies.

The question here is, what is the value of this symptom in wounds of the chest? S. Cooper says, almost "all these wounds occasion pain and difficulty of breathing." Dr. Gibson says, "when the *lungs* are wounded, the patient is instantly seized with difficult respiration, accompanied by great anxiety and a flow of blood from the mouth," * * * "these symptoms are sufficient to assure the surgeon of the nature of the case." Fraser's statements are in conflict with these; he states that out of nine cases observed by him, in which the lung was wounded, only three had dyspnoea. In the experiments detailed, it will be observed, that, notwithstanding, the lung substance was wounded, there was no dyspnoea until there was partial collapse, though I do

not deny that there may be dyspnoea under such circumstances without collapse. It is evident, therefore, that dyspnoea may be present, either with or without lung wound.

Hæmoptysis.—This symptom has been considered by many able surgeons as a positive proof of lung wound; but at the same time it is admitted that the lung may be wounded and the patient not spit up blood. Dr. S. Cooper says, "there can be no doubt of the lungs being wounded when the patient is observed to spit up blood; but the absence of this symptom is not a positive proof of their being untouched, though unquestionably a very important circumstance in the diagnosis, and generally speaking a correct criterion of the lungs having escaped injury. At all events, when no blood is spit or coughed up, the lungs can never be deeply penetrated." Fraser states that out of nine fatal cases observed by him in which the lungs were wounded, only one had hæmoptysis, and that out of seven fatal in which the lungs were not wounded, two had hæmoptysis. In none of the dogs experimented upon by myself did this symptom occur, though the lungs were several times wounded, and in one instance entirely pierced through, which contradicts Cooper's statement, that the lungs cannot be deeply penetrated when this symptom is not present; yet this condition will more frequently arise when the wound is deep, as the blood will pass into the large tubes, causing irritation and spasmodic action, which will throw the blood into the mouth, while, if the wound be superficial the hemorrhage will be slight, and will find a more ready exit in the opposite direction.

Taking the facts as presented, we may conclude, that hæmoptysis may result, either from penetration of the lungs, or from blows upon the chest producing contusion or concussion without penetration; that its presence is not positive proof of the lungs being wounded, or its absence, of their escape; though it is a valuable symptom, and when taken in connection with the color and character of the blood expectorated, is probably as conclusive as any single symptom that may arise.

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Emphysema.—When an opening is made into the thorax, and air passes and repasses with the rise and fall of the chest, it sometimes infiltrates the cellular tissue, giving rise to a condition called emphysema. The value of this symptom in chest wounds has been variously estimated by different authors. Without stopping to discuss the question more fully, it is sufficient to say, that it may be present either when the lung is wounded, or when the cavity is simply entered, and it may be absent when both of these conditions are combined; its presence or absence, therefore, will be of secondary importance as a diagnostic symptom.

Pneumonia.—Is there pneumonia developed as a consequence of wounds of the lungs. This question has an important practical bearing. If it be the case, active depletory measures would be required from the beginning, to prevent the inflammation, or hold it in check; while if it is not the case, such measures would only further reduce the patient, probably already exhausted by the loss of blood. It is probably less frequent than has generally been supposed, for though inflammation is a known result of wounds, it is not an invariable result, and there is no reason why the lungs should be more frequently affected, proportionately, than other parts of the body. Again, though inflammation is a result of wounds, that inflammation is of a different character from the inflammatory action set up in morbid conditions of the system. As an instance of this, compare the inflammation resulting from a wound, with erysipelas. The same may be said of the lungs; inflammation may be set up, but it is probably not true pneumonia.

Experiment 9th. The chest of a dog was transfixed from side to side with a slim rod of iron, which was thrust in between the 4th and 5th ribs, on the right side, midway between the sternum and spine, and out at the same point between the corresponding pair of the left side. The wound closed immediately on the withdrawal of the instrument. There was no passage of air, and but few drops of blood escaped. There was no dyspnoea, and the dog

took food soon after the operation. At the end of the first day there was fever, and he was evidently unwell. These symptoms disappeared, however, and by the end of the third day he was very lively. On the fifth day the dog was killed, and on examination, the wound could be traced through the middle lobe of the right lung, thence through the right auricle of the heart, just above the entrance of the ascending cava, and then through the left auricle, just below the entrance of the pulmonary vessels. No wound could be found in the left lung. There was congestion of the right lung, but no inflammation. The lung crepitated on pressure, and pieces of the congested portion floated in water. The left lung was healthy.

It will be noticed that in none of the cases detailed was there inflammation; there was only congestion, and that congestion, in all the cases except the last, was limited to the place of injury. Fraser states that of the nine fatal cases in which the lungs *were* wounded, not one had pneumonia, and that out of nine fatal cases in which the lungs *were not* wounded, it was present in one case.

Pleuritis.—Very much the same may be said here that was said in pneumonia. There may be local inflammation, with effusion of lymph, and adhesion may take place around the wound; but the whole pleura is seldom involved. It may be more frequent than pneumonia, owing to the greater disposition of inflammation to spread over serous membranes.

Passage of Air at the Wound.—It is unnecessary to dilate upon this point, as it has been conclusively shown, by experiment, that it may take place either when the lung is wounded, or when the cavity is simply opened. Fraser thinks, that when the lungs are wounded the passage of air must cease. I can see no reason for this; in fact, in my experiments, I have seen the air pass freely, whilst the examination proved the lung to be wounded.

In summing up the value of the different symptoms detailed, I think, it will be evident, that no one of them is sufficient, of itself, to

justify the surgeon in diagnosing lung wound. It is only when several of them occur, taken in connection with the history of the case, and the manner in which the wound was inflicted, that a correct conclusion can be arrived at.

The conclusions I have drawn from the foregoing are as follows :

1st. That the lung does not collapse immediately on an opening being made into the pleural cavity, unless the opening be larger than the glottis.

2d. That collapse, when it does occur, will take place in a time proportionate to the size of the opening.

3d. That collapse does not follow *wound of the lung*, unless the opening in the walls of the chest be of sufficient size to produce it.

4th. That profuse hemorrhage seldom follows wound of the lung.

5th. That pneumonia does not supervene upon wound of the lung unless there is a tendency to inflammation from other causes.

6th. That pleuritis is a rare result except as a local affection, that is, limited around the place of injury.

7th. That air does not cease to pass at the wound when the lungs are wounded.

8th. That uncomplicated wound of the lung will generally heal without suppuration.

Medical Societies.

PHILADELPHIA COUNTY MEDICAL SOCIETY.

(Reported by Wm. B. Atkinson, M. D.)

WEDNESDAY EVENING, FEBRUARY 15.

DR. REMINGTON, (President) in the chair.

Subject for Discussion—BLOODLETTING.¹

DR. HENRY HARTSHORNE remarked that he could not join in the desire expressed by one of those who have spoken in this debate, to dispense with reference to the *past*, upon the subject under discussion. We cannot afford to do without the *past*. This attempt to reason, or to escape argument, by turning the back upon all experience and science, except those of the present time, is, however, not uncommon amongst those who now discuss this and similar topics. But its frequency does not make it proper. In fact, (to express strongly an opinion decidedly entertained,) the science of this age may

¹Continued from the meeting of Jan. 11th, page 515 of Vol. III, (March 10th.)

be characterized, especially, as displaying *great wealth, and great shallowness*. With all the resources, which have been accumulating since the beginning of time, at our command, and with vastly extended and improved means of investigation, the wealth of science, in material, is unbounded; but there never was a time when so little disposition was manifested to make a rational use of this material,—by drawing, and maintaining when drawn, sound and just conclusions. And the fact of a discussion being anywhere possible, at this period of time, upon the question whether bloodletting, general and local, ought to be retained or not, as a remedy in the treatment of disease, proves that medical science has suffered equal emasculation with the science of other departments.

The idea which Dr. H. entertained of the history of bloodletting was simple: This remedy was, no doubt, suggested by nature; by the relief afforded by spontaneous, critical or accidental hemorrhages, in cases of inflammation or vascular determination; and by the sensations, almost instincts, of those suffering under such affections. Thus originated, bleeding had become a common remedy before medicine could claim the name of a science in the days of those whom Herodicus and Hippocrates called the ancients. Very few of the noted names of antiquity have come down to us recorded in opposition to bloodletting. The most distinguished of these, Chrysippus the Cindian, and Erasistratus his pupil, were equally conspicuous for their objection to the use of purgatives in medicine. Physiological errors were, in them, much more pardonable. The dogma that the arteries contained air, not blood, was much more excusable in their day, than is the error in pathology, of those who now hold, that, from a practical point of view, exudation is the only essential phenomenon in the inflammatory process. From the time of Galen to the present, every real discovery in physiology and pathology has only rendered more intelligible the use of bloodletting in appropriate cases; while, at the same time, experience and science have limited its employment, and thus, of course, enhanced its true value.

Now, however, it is a fact, that the lancet has more opponents and fewer defenders, than at any previous period in medical history. By very many practitioners in Europe and in this country it is altogether abandoned; and even local bloodletting has been brought to a position of similar disfavor. Why is this? We may explain it as resulting from the following causes:

1. Reaction from previously existing abuse of the remedy.
2. A change in the human constitution, occurring under the artificial habits of civilized life.
3. False construction and misapplication of recent science.

4. Leadership and fashion.

The first of these modes of causation must have had place involuntarily and unconsciously. No one can justify it. Because Doctor Sangrado used no remedies but bloodletting and warm water, it does not follow by any kind of medical logic, that Doctor Papaver should use only opium and the warm bath. Cullen, Rasori, Chomel and Bouillaud may have bled, and the last named may still bleed too much. Dr. Rush may have bled too often, although some of us know that his pupils, at least, were careful as to the amount of blood they took. But such extremes, wherever they existed, do not give reason for their opposites. Yet I have in my hand a *Treatise on the Practice of Medicine*, which has passed through its third London edition, and has been republished here, which represents the "advanced (?) school of practice, and in it I find the abstraction of blood discouraged and objected to throughout, not only in pneumonia, but in pleurisy, in meningitis, in pericarditis, etc., it is denounced in *all cases*; and the substitutes are opium, fomentations, etc.

That a progressive change in the constitutions of men, has been and is going on in civilized life, and most of all, in large and crowded cities, is undoubted. In a well-fed and active rural population it may not be observable; but the blood of the Londoner is less rich, and his vital capacity of resistance against depression lower than those of his progenitors a hundred years ago. This must be borne in mind; because it is in cities that most of the statistics have been obtained, which are made use of in the argument upon this subject.

Of the scientific question, the first branch is that pertaining to *therapeutical science*. This requires to be asserted with emphasis; because it has been intentionally ignored or depreciated in this controversy. Although from the complexity of its nature necessarily farther from maturity than pathology or semeiology, the long accumulated facts concerning the influence of remedial treatment upon disease, constitute a *body of science*, which must be respected and dealt with as such.

Dr. Bennett assumes that all the testimony of Sydenham, Cullen and Gregory to the usefulness of bloodletting in pneumonia, is null, because those distinguished men were not acquainted with physical diagnosis. There is a fallacy here. No doubt there were many cases of pneumonia which, without auscultation and percussion, it was impossible, in the time of Sydenham, etc., to detect. But this does not alter the value of their experience, which was positive as far as it went. Their powers of observation of symptoms and results, were equal to those of Bennett, or Louis, or Skoda. The pneumonia which they describe was frank, open pneu-

monia, with constitutional excitement. And, when they tell us that pneumonia, with such characters, did well under bloodletting, and worse without it, their testimony is available, notwithstanding the fact that there are now discoverable by physical diagnosis, other cases of pneumonia, with different symptoms, and in which a different treatment is appropriate. To reason otherwise, would be to make a name take the place of a reality.

Numerical statistics have been especially appealed to by the opponents of the use of bloodletting. In regard to these statistics, it must be remarked that pneumonia has been, without sufficient reason, selected as the *instantia crucis*, and that their general value is impaired by the necessity of obtaining them, in almost all cases, from *city hospitals*, which present subjects for treatment lower in vital energy than the average of those met with in practice. Yet, it has been shown, in an elaborate and dispassionate article in the British and Foreign Medico-Chirurgical Review, that a thorough analysis of all the statistics upon the subject, published in Great Britain and on the continent of Europe, determines a conclusion in favor of the moderate and discriminating use of bloodletting in pneumonia.

It is in the physiological and pathological considerations which lie at the basis of this question, that false construction and misapplication of the facts of science have been most observable and most important. In physiology, a great error has been committed, which it is a matter of surprise to find not corrected even in the latest American publication upon the subject—that of Prof. Dalton. This error is, the denial or depreciation of the *active* part taken by the arteries in the circulation, and of the great fact, without recognition of which no theory of inflammation can stand, that the arteries are subject to *reflex* excitement, the most normal form of which constitutes active hyperæmia, the most abnormal and exceptional, tonic constriction of the vessels.

The most complacent assumption possible to a writer upon a scientific subject is exemplified by Prof. Bennett, in his late and otherwise useful work upon "Clinical Medicine,"—in dropping the term "inflammation" altogether. It is alluded to by him only in a note; *exudation* being substituted for it. Like the "hyperæmia" of Andral, and the "stasis" of Eisenmann, well said by Rokitsansky to have failed in their attempt to take the place of the accustomed term, this effort to substitute a part for the whole must also fail. But while it is being urged, it must do harm. Another error is committed by Professor Virchow, of Berlin, who, with all his great ability, has evidently one of those micrological minds which can only see or dwell upon one fact or idea at a time. This idea, with him, is not the *exudation*, so much as its asserted *cause*; the "nutritive excite-

ment," "stimulation," or "irritation," which is assumed to differ, whether in its physiological or pathological manifestations, rather in degree than in kind. Like Bennett, however, and like almost every other physiologist and pathologist of the day, Virchow ignores the importance of the active arterial hyperæmia which surrounds, in inflammation, the central seat of stasis and exudation. The setting aside of these obvious and cardinal phenomena is of vital consequence, as it is precisely their part of the inflammatory process that is controllable by treatment. The observations of the most accurate pathologists, as Rokitsansky, Paget, Jones, and others, consist perfectly with the idea that determination of blood toward an inflamed part conspires with the central stasis in *causing* the exudation; and that a *proportion* exists between the *degree* of this active turgescence and the *amount* of the exudation, and the character of the changes which it subsequently undergoes. It would occupy more time than we have to spare, to show how, upon this idea, (or rather *fact*), rests the scientific justification of local and general bloodletting, in the treatment of high inflammation.

Nor would it be right to occupy you longer with a discussion of the claims of Prof. John Hughes Bennett, of Edinburgh, or of Prof. Skoda, of Vienna, or of other "advanced" teachers, to a position of *leadership*, in opposition to the recorded judgment of the profession in all time. It will suffice to quote the words of the late Dr. Alison, that "if Dr. Bennett's pathology leads necessarily to the belief that the principle in therapeutics which the great body of practitioners, since medicine has been a subject of reflection to mankind, have adopted in regard to the effect of bloodletting in the early stage of inflammatory disease, is false, I confess that I should think that a much better reason for setting aside his pathology than their therapeutics." It may be added, too, that Dr. Bennett does not yet have it all his own way. Besides Alison, we have, in Great Britain, leading minds such as Watson, Christison, and Chambers; on the continent of Europe, Wunderlich and others; and in this country, a name of equally cosmopolitan influence—that of Prof. Wood—ranged in defence of the opinion, that although science and observation have limited and rendered more discriminating the use of bloodletting as a remedy, its total abandonment would be an error, for which no justification can be found, either in the facts of clinical experience or in those of pathological science.

DR. HAMILTON regretted, in view of the paramount importance of the subject under discussion, that the inclemency of the weather had probably prevented a larger attendance, and especially as the arguments were chiefly on one side. He thought it

had been attempted to discuss the subject of blood-letting in a too general way, more so, at least, than experience and a rational pathology would justify. He could not always resort to the lancet simply because inflammation or fever of an active character existed, nor would he always refrain from its employment when neither inflammation nor fever was present. "A just appreciation, so far as this is practicable, of all the circumstances of the case, must be our guide. Inflammatory action and general fevers are evidently conservative in their ulterior purposes and general tendency, and therefore, so long as these do not, by excess, threaten to destroy tissues or functions essential to life, do not stand in need of sanguineous depletion, and may no doubt, in a vast majority of cases, be conducted to a favorable issue without such agency. But the exceptional cases must be met; and in regard of inflammation, no mere theory of this disease (no matter how plausibly it has been attempted to show that it consists in a definite series of eliminative and reparative processes, liable to injurious or even fatal interruption from venesection) can convince the great majority of practitioners of the uselessness or ill effects of this practice in such cases. On the contrary, of the utility of venesection we have numerous examples occurring on the exterior surface of the body, and consequently are matters of ocular demonstration. The eye, or its mucous membrane, when violently inflamed in an individual of unbroken constitution and robust health, may furnish an example of this sort. Here the advantage of sanguineous depletion is palpable; and yet this same organ, to all appearance as severely inflamed as in the case just stated, may, in the man of enfeebled, deprived, or excessively nervous constitution, receive no benefit whatever, or perhaps a positive injury. Now, analogy would lead us to expect the same results under similar circumstances, in the case of internal inflammations, and experience has proven this expectation to be well founded, the benefit obtained by venesection in such cases being generally greater than in the instance of external inflammation. The attempts to entirely proscribe the employment of the lancet by an exhibition of the statistics of hospital practice, have also failed to convince the profession at large, even where the tables, untrammelled by the influence of a cherished theory, have been fairly made out. The late period at which many of these cases come under treatment, and the large number of diseased or impaired subjects contained in the statistical tables, render them unreliable as a guide in general practice, especially in rural districts.

There is another and totally opposite pathological condition, requiring more imperatively the use of the lancet, and this is venous congestion. Let us again take, for example, the case of a man of robust

and unimpaired constitution, about to be attacked by pneumonia, but in whom no reaction has yet ensued. If an extreme case, he will present these general features: cadaveric aspect of face, diminished heat, and constriction of the whole cutaneous surface, coldness of the extremities, tip of the nose and ears, with more or less lividity of these parts; breathing exceedingly short, quick and oppressed, with expansion of *alae nasi*; no cough, or if any, unattended with expectoration, unless it be of frothy mucus, perhaps tinged with blood; tongue either natural or, in common with the mucous membrane of the mouth, paler than natural, otherwise livid; the pulse small, frequent, or the reverse, depending, probably, on the peculiar condition of the subordinate nervous centres. Thus the whole aspect of such a case is simulative, if not in reality indicative of approaching dissolution. Than this, no pathological condition is more fully established, and perhaps there is none so suggestive in a therapeutic point of view. We have here the very opposite of what we see in inflammation; and bad as the latter may be, the former is infinitely worse. Venous congestion occupies at least the entire thoracic viscera, and soon extends its baleful influence throughout the whole organism. The functions of life are, as it were, clogged in their sources; in what abeyance these functions are, in the ramifications of the peripheral capillary system of the entire economy, is but too manifest, even in the exterior view of the case. Life cannot long struggle under such a pressure. The general sensorium and subordinate nervous centres must have the stimulus of oxygenized, arterial blood, instead of the languid circulation of blood, carbonized to the highest degree, and thus rendered absolutely poisonous in its operation upon the economy; otherwise these controlling centres must in turn cease to supply that influence, without which there can be no vital action. To administer stimulants alone in such a case, without using the lancet, would be to rely upon the subsidiary, and to neglect the chief remedial means; and yet it is in precisely such cases that objection has been, and continues to be interposed in regard to sanguineous depletion. We are told death has often ensued a short time after such depletion, as if dissolution were not threatening at every moment in these cases. That the abstraction of eight or twelve ounces from thirty pounds of a fluid, unsuited in its present state to the purposes of life, and otherwise injurious from its congestion in the cavities and great vessels of the heart, and other viscera, should, when supported by stimulus, still further depress the vital force, is simply absurd, and the proof of this is found in the fact, that with the finger on the wrist during venesection, we shall, in nearly every instance of this sort, find the pulse to increase in

volume, and beat with more freedom and regularity, and the restoration of an impeded circulation and improved quality of blood, be manifested by improvement of its color and freedom of issue. The heart and lungs thus relieved of a load, (as the patient generally expresses himself,) the various functions begin to resume their normal character, and the altered countenance of the man, the returning warmth and color of the skin, the increased freedom of respiration, etc., proclaim, in unmistakable language, the propriety of the course pursued. Reaction and inflammation now ensuing may be violent, or otherwise, but the patient will at least have a fair chance in the contest. As in this, so in every other case of extreme congestion in subjects of a robust and strong constitution, and where no exhausting discharges have occurred, the use of the lancet is not only safe, when *timely* employed, but absolutely imperative, aided, of course, by appropriate stimulants. That the *facies morbi* in these extreme cases (fortunately not very common in our climate) has sometimes intimidated the practitioner, is but too probable, and this timidity has perhaps been increased in the prospective view of the opinion of the friends of the patient, in case of an untoward result. As a remarkable instance of the destructive agency of venous congestion, happening in our own country, Dr. H. made allusion to cases of cholera, reported from the plantations of Louisiana, in the year 1849, where the negroes of the same plantation were carried off, some by the usual way of vomiting and purging, and others without any evacuation of the stomach and bowels whatever, and without any reaction, the *materies morbi* having acted so powerfully in the production of fatal congestion, as to have afforded no time for the disease to pursue its ordinary course. These, he thought, were cases especially adapted to show the beneficial results of combined depletion and stimulation at the first moment of attack.

DR. BELL could give his ready assent to nearly every position taken by the gentleman who opened the discussion of the subject this evening. Blood-letting may seem at first to be a harsh remedy, but it is one clearly suggested by nature in the hemorrhages which relieve congested and suffering organs. The observing physician, turning to account the hints thus furnished, will often anticipate the irregular and uncertain action of spontaneous hemorrhage, and procure by venesection a safe issue to the redundant blood in the vessels and the congested viscera. Seeing the great relief in violent headaches and local plethora of the brain, obtained by even slight epistaxis, he will not wait for this result at the hazard of hemorrhage taking place in this organ itself, as in the case of sanguineous apoplexy, but will carry out the indications thus fur-

nished, and have recourse to free venesection, and thus prevent the disastrous consequences which would have followed his inaction, or other kinds of medication based on a speculative pathology. We cannot envy the feelings of the physician who sees a friend, patient, or even a casual acquaintance with the symptoms of fulness of the head, suffused and deeply colored face, a full, hard and slow pulse, and fails to apprise him of his danger, and of the best and safest means of prompt relief, viz: in blood-letting. How often would suicide be prevented by a timely venesection, while physicians would speak to the individual as to a bodily sick man, rather than attempt to reason with him as an insane one. In the first instance, we may win his confidence and his assent to the treatment recommended; in the second, he will reject our advice with disdain.

The changes occurring in an inflamed part, have been often described, but there is no little discrepancy of opinion, based, in each case too, on experimental observation, regarding the importance to be attached to the phenomena which offer themselves to our notice. One of the reasons assigned for blood-letting in inflammation is, that the *vis a tergo*, represented by the quantity and momentum of the blood going to a part, is thereby diminished. Some pathologists—Paget, for example—will tell us that it is not the *vis a tergo* which produces the chief symptoms of inflammation, but the *vis a fronte*, the attracting power which increases the force of the arteries, and this is the most important part of the morbid excitement. The changes in visible inflamed texture, diminished fulness, tension, color, and sensibility—caused by the local abstraction of blood are very evident, and we may legitimately infer that similar, if not equally certain results in internal inflamed organs are produced by general blood-letting. The approach to syncope which, following not unfrequently a large detraction of blood, is accompanied by paleness of the skin, and diminished fulness and activity of the capillaries of this tegument, which indicate a correspondingly diminished action of the circulation in internal membranes. It may be alleged that effects of this nature are but temporary, and that reaction requires a repetition of the remedy. We have, however, abundant evidence to prove that inflammation has often been at once arrested or greatly abbreviated in its course by blood-letting. Even short of the full measure of cure of the disease, ought we not to be grateful for the possession of means by which we can relieve our patient of pain and other distressing symptoms, such as violent headache, wakefulness, etc. The boon of sleep, often refused to opium, is granted to blood-letting, and often, also, the latter acts the part of a faithful ally, and prepares the system to be beneficially acted on by the former.

With blood-letting, as with other things, there are periods of intermission in its use, owing to an abuse or lull in the conditions which had previously called for it. But at no time or season are we safe or wise in saying, that we can dispense with it entirely. Two cases at the same time, recently under his care, will serve, Dr. Bell thinks, to show the difference which must modify the treatment of disease and the use of a remedy. In the one, of a very aged person, who had been exempt from any serious malady, and who was gradually approaching the bourne of life, pleurisy came on, it was very soon removed by moderate doses of salines, opiates and antimony. In the other, of a person in middle life who was seized with pleuro pneumonia, but still not of a very intense although decided character. Venesection was practised with much relief to the patient, but morbid phenomena being still troublesome and painful, cupping was had recourse to, and was followed by entire freedom from pain and by easy respiration. The convalescence was rapid.

DR. RUSCHENBERGER had seen on board the frigate Brandywine in 1826, cases of pleurisy, pneumonia and dysentery. It was then the routine practice to bleed. He would find on the berth-deck, in the sick quarters, after the surgeon's morning visit six or seven arms bleeding at the same time. So confident were medical men of that period in the efficacy of blood-letting in almost all diseases, that the question asked in the examination of each case was, "Will he bear bleeding, or how much can he lose?" and not, "Is venesection needed to cure the disease, or is it the best remedy in the treatment of the case?" Cups and leeches were additionally employed. Later, in 1835-36, in the East Indies, on board of the United States ship Peacock, he encountered a fever at Bombay, and of the entire ship's company, of 201 souls, only one escaped being attacked—cerebral symptoms predominated, and there was more or less delirium in every case. All were leeches, and freely, and success followed in every instance. Again, in the East Indies, in 1847-8, he had met a great deal of dysentery, but no fever, and he bled scarcely one during the whole cruise. The deaths were not in larger proportion than when venesection was practiced. Lately, in the Pacific, on board of the United States ship Independence, 500 men were under his charge, of whom not one was bled during the entire cruise of three years. Dry, and occasionally scarified cups sufficed. It seemed to Dr. R., that the character of disease, as well as the general force of the constitution were much changed, and that seamen would not bear venesection as well as they did twenty and thirty years ago. Pleurisy was treated with opiates, dry cups, and hot fomentations; and pneumonia much in the same manner. More than

1,600 cases of disease were treated, and he lost from all causes, during the cruise, nine cases, including one of black vomit, and one suicide by drowning. On the coast of Peru, in 1827-28, he had met dysentery, and as well as he could recollect he had 250 cases, all were bled and cupped, and eight died.

Adjourned.

EDITORIAL DEPARTMENT.

Reviews and Book Notices.

Clinical Lectures on the Principles and Practice of Medicine, by JOHN HUGHES BENNETT, M.D., F.R.S.E., Professor of the Institutes of Medicine, and Senior Professor of Clinical Medicine in the University of Edinburgh, etc. etc. etc., pp. 952. New York; Samuel S. & William Wood. 1860.

We have received from the publishers a reprint from the last Edinburgh edition of this valuable work, prepared in their best style, the type clear, and the cuts, with which it abounds, superbly executed.

Perhaps no work, treating of the same subjects, has had such a rapid and extensive circulation, and, whatever may be said regarding the peculiarities it contains, all must admire the industry and research of the author, whose deductions have been derived from long study and clinical observation.

The plan of the book appears admirably adapted to teaching clinical medicine, beginning with the more simple and rudimentary subjects, the reader is led, step by step, into the more complex and important details of recorded experience, his path at all points illustrated with well-executed drawings. To the already comprehensive character of the work, there have been added, in this edition, fifty pages of new matter, twenty one new cases, and thirty-four wood-cuts.

This work has been long enough before the profession for it to judge of the merits of the peculiar views of pathology and therapeutics advanced by its author; hence, we do not consider a lengthy notice by us necessary. We recommend it as one of the most popular medical works of the day.

J. W. L.

Drs. Demarquay and Laconte have recently ascertained that, if a wound or sore be kept for a sufficient length of time in an atmosphere of carbonic acid, it will heal much more rapidly than in common air; oxygen, on the contrary, will retard the process of cicatrization.

THE MEDICAL AND SURGICAL REPORTER.

PHILADELPHIA, SATURDAY, APRIL 14, 1860.

REMUNERATION OF MEDICAL SERVICES IN THE NAVY.

It is an axiom of trade, that an article is worth what it will bring. If we are to determine the value of medical and surgical knowledge and skill on such a principle, we fear that there must be a wide difference of opinion between the public and the profession, as to the pecuniary worth of the services rendered to the sick and wounded, unless we change the habit of medical men in giving their time and labor without first stipulating in each case the sum to be paid for them. But such a change is not feasible, because the masses are not competent to judge of the skill of physicians in the management of patients. It is well known to the profession, that there are members of it who, in spite of deficient education and natural endowment, enjoy largely public confidence and lucrative business, while others, known to possess qualifications of the highest order, are barely able to support themselves and families by their labors. If the public were capable of justly appreciating and discriminating in the premises, the reverse would be true; the learned, talented and skilful would receive the large pecuniary rewards, while the mediocre and inferior practitioners would acquire a small share of public patronage proportioned only to their respective abilities. In the competition for employment, we may suppose, even if all practitioners were equally qualified, the most necessitous would sell their services at the lowest rates, rather than not sell them at all. It is no disparagement to the medical officers of the army and navy, to suggest that want of that capital by very many young members of the profession, which is necessary to procure professional business, is the only reason why the government is able to keep in its employ well qualified surgeons to treat the sick and wounded in its army and navy at very moderate, if not extremely low rates of compensation. Medical service has been always better paid in the army than in the navy.

The policy of the government, we presume, is to retain in its service the experience which its military officers acquire, and therefore it is, that pay is made to increase with increasing years and increasing rank, and the scheme of compensation is computed for lifetime. All the old governments have found it necessary, in order to attract and retain men of talent and education in the official positions of their military organizations, to provide not only salary during life, but also pensions for disabilities by wounds or otherwise, and for the widows and orphans of those who perish in their armies and navies. Men of talent and acquirement, who are without the necessary capital to enter upon employments in which success depends, not upon governmental, but upon private patronage, will enrol themselves in the military departments, because they obtain at once an income sufficient to secure a respectable, certain and comfortable maintenance.

It is to the policy just alluded to that we trace the origin of the half-pay, retired pay, reserved pay, longevity rations, pensions for good service, pensions for wounds, pensions for officers' widows and children, to say nothing of honorary distinctions, mentioned in the blue-books of Great Britain, from which we have copied so much in our military system, by land and sea. All such institutions are designed to attract competent men to the military service, and retain them in it, at the least cost, and at the same time preserve the activity and efficiency of the army and navy. Thoughtful men perceive that the time has come when it is necessary to establish retired lists of the enfeebled and aged officers, and resort to other measures calculated to diminish the number of resignations annually occurring in every grade of the services.

These notions are suggested by the recent but unfortunate effort to create a reserved list in the navy, the proposal to make a retired list in the army, and the bill "to increase and regulate the pay of the navy," which passed the Senate of the United States on the 27th ultimo. This bill, it is understood, is designed to add on an average of about twenty-five per

cent. to the present rates of pay for all grades. Through inadvertence somewhere, it is believed, the medical officers are likely to suffer by having taken away from them a part of the very moderate compensation they receive under the present laws.

The pay of medical officers was last established by a law enacted March 3, 1835, just a quarter of a century ago. By this law, assistant surgeons receive, when employed, \$950 per annum, and while "waiting orders," \$650. After five years, and having been examined and found qualified for promotion to surgeon, waiting orders, \$850; employed on shore, \$1,150; and at sea, \$1,200.

Surgeons are divided into five classes, for pay.

1. Those commissioned less than five years receive \$1,000.

2. Those commissioned between five and ten years, receive \$1,200.

3. Those commissioned between ten and fifteen years, receive \$1,400.

4. Those commissioned between fifteen and twenty years, receive \$1,600.

5. Those commissioned twenty years and upwards, receive \$1,800.

When employed on shore, they receive an increase of one-fourth, and at sea an increase of one-third of the foregoing amounts; and surgeons of the fleet an increase of one-half; so that it was possible, at the time when this law was enacted, and when the cost of living, in almost every part of the world, was fifty per cent. less than at present, a medical officer, after twenty-five years in the navy, might receive \$2,700 per annum while at sea, supervising the medical affairs of a squadron. As we employ but six squadrons, only six surgeons can occupy the post of surgeon of the fleet at the same time, and at the expiration of the cruise they fall back again upon \$1,800.

Considering the degree of qualification required for admission and promotion in the naval service, the perils and privations of naval life, the highest rate of compensation is very moderate, and is very much less than the

same class of men in the profession attain after a quarter of a century's practice and experience.

It was found, however, in the course of a few years, that gentlemen served, on an average, twelve years as assistant surgeons, and, when promoted, were placed in the first class for pay, and then, even if they could be appointed one of the six surgeons of the fleet, they could receive only \$1500 a year. To remedy this in some degree, Congress enacted, in 1848, that in calculating for the pay of surgeons, the time upon the graduated scale of pay should be reckoned from their original entry into the service. The effect of this law was to place the surgeon promoted after being ten years an assistant, in the third, instead of the first class, for pay, and also to advance all the junior surgeons, in the rate of pay, according to the number of years they had been in the navy.

This enactment of 1848 was an imitation or copy of the regulation which governs the rates of pay of medical officers in the navy of England.

When the bill "to increase and regulate the pay" was prepared, this feature in the existing law on the subject was overlooked, and the pay of surgeons was made to count from the date of their commissions, instead of from original entry into service. And, although about twenty-five per cent. was added to the five rates of pay, the effect of the bill is to reduce the pay of nearly one-half of the surgeons in the navy in various degrees, in some to the extent of \$500.

The Senate's bill preserves the five rates of pay for surgeons; they are as follows:

		Other Waiting		
		At sea.	duty.	orders.
1st—Surgeons for the 1st five years,		\$1,900	\$1,800	\$1,400
2d— " " 2d " "		2,200	2,100	1,600
3d— " " 3d " "		2,500	2,300	1,800
4th— " " 4th " "		2,700	2,600	2,000
5th—after twenty years and upwards,		3,000	2,812	2,250
Assistant Surgeons, under 5 years,		1,187	1,087	812
" " over 5 years,		1,500	1,437	1,062

The surgeons promoted in the course of the past year had been in the service fourteen years, or very nearly; as they entered between the ages of 21 and 25, they must be now be-

tween the ages of 35 and 39, and are placed on the lowest rate of surgeons pay, and, should they live to be fifty-five or fifty-nine years old, they will be entitled to receive the highest rate, provided they be physically able, at the age of sixty, or thereabouts, to live at sea in the ward-room, associated with gentlemen of half their years.

When contrasted with the rates of pay assigned to other grades in the navy, those proposed for medical officers appear to be lower even than when viewed apart, and might be considered indicative of the low pecuniary estimate at which medical services are held by the representatives of the people. For example, the pursers who need no qualification besides adult age with the integrity and intelligence common to gentlemen engaged in ordinary commercial pursuits, are assigned immediately on appointment, a higher rate of pay than the surgeon on promotion, after fourteen years' service and probation. Five rates of pay, based on length of service, are assigned to pursers; they will have more compensation, employed ashore or afloat, than the surgeons, and the same pay while waiting orders, as may be seen by comparing the preceding with the following statement:

		At sea.	Other duty.	Waiting orders.
1st—Pursers for the 1st five years,		\$2,000	\$1,800	\$1,400
2d “ “ “ “	2d “	2,400	2,100	1,600
3d “ “ “ “	3d “	2,600	2,300	1,800
4th “ “ “ “	4th “	2,900	2,600	2,000
5th “ “ “ “	twenty years and upwards,	3,100	2,800	2,250

A knowledge of accounts alone, is more highly estimated than when added to unquestioned professional ability in the science of medicine and surgery; it is not assuming too much to believe that any gentleman qualified to be admitted as an assistant surgeon in the navy, is also qualified to be appointed a purser, so far, at least, as technical or peculiar knowledge is requisite.

The lieutenants are also divided into five classes for pay; they serve in the subordinate grades of midshipman, passed midshipman, and master, a little more than nine years prior to promotion.

The rates of pay proposed for these grades are as follows:

	At sea.	Other duty.	Waiting orders.
Midshipmen, - - - - -	\$550	\$500	\$450
Passed Midshipmen, - - - - -	1,000	800	650
Masters, - - - - -	1,200	1,100	825
1st—Lieutenants, less than 7 years sea-service, - - - - -	1,500	1,500	1,200
2d “ “ “ “ after 7 “ “ “ “	1,700	1,600	1,266
3d “ “ “ “ “ 9 “ “ “ “	1,900	1,700	1,333
4th “ “ “ “ “ 11 “ “ “ “	2,100	1,800	1,400
5th “ “ “ “ “ 13 “ “ “ “	2,250	1,875	1,450
Commanders for the 1st five years, - - - - -	2,800	2,662	1,908
“ “ “ “ “ 2d “ “ “ “	3,150	2,825	2,016
Captains, - - - - -	4,200	3,750	2,750
“ “ “ “ “ in command of squadron, - - - - -	5,000		

The lifetime scheme of pay in the line of the navy, beginning as a boy, a professional student, runs from \$550 a year, at sea, up to \$5,000, or nearly ten times increased. But these rates of compensation, considered in themselves, are not large, and are quoted here only to sustain the notion expressed, that our profession has not the pecuniary consideration which it ought to command from Congress.

The sea-service of lieutenants includes their service afloat while midshipmen, &c.: in this respect they thus compare with surgeons, divided in like manner into classes.

	Lieutenants.	Surgeons.
1st. Of less than 7 years service at sea,	16	2
2d. Of more than 7 “ “ “ “	43	2
3d. “ “ “ “ “ 9 “ “ “ “	42	10
4th. “ “ “ “ “ 11 “ “ “ “	49	27
5th. “ “ “ “ “ 13 “ “ “ “	175	28
Total number in the Navy,	325	Total 69

There are nearly five times as many lieutenants as there are surgeons in the navy, and considering the ages of the two grades when they respectively begin to serve at sea, the comparison is not very largely in favor of the lieutenants, who are necessarily at sea a considerable part of the time during which they are acquiring their professional education at the cost of the government, which is not the case with medical or other staff officers of the navy.

Congress might place the medical officers of the navy, at least, upon a footing with pursers, and provide a scale of pay for surgeons of the fleet. A surgeon of the fleet who has served a quarter of a century in the navy, ought not to be paid less than a captain.

We boast not a little of our native intelligence, of the astuteness or ability of our statesmen, and point to them as the motive force which explains the rapidity of our prosperous growth; but it is, nevertheless, in the opinion of a vast number of our fellow citizens, a great comfort to have precedent for our acts, because if some should happen to disapprove, we can abate, if not entirely silence the censorious by pointing to the examples we have followed, taking care, of course, to assert them to be excellent, and thus escape argument on the intrinsic merits of the case.

We are assured that there is no practice in our own navy which has not its analogue in that of Great Britain. Details are imitated so far, that we have copied even the uniform dress of English naval officers, substituting only, an eagle for the crown emblazoned on their buttons; we copy the blue cloth, gold lace ornaments and all. For this reason, it may be considered proper to state here the pay medical officers of the British Navy, with some other grades of the same service.

The pay is reckoned from original entry into service, as follows:

Assistant Surgeon,	under 5 years' service,	\$912
" "	after 5 "	1,049
" "	" 10 "	1,186
Surgeon,	" 10 " or on promotion,	1,369
" "	" 15 "	1,642
Staff Surgeon,	" 20 "	2,007
" "	" 25 "	2,281
Deputy Inspector of		
hospitals and fleets,	" 20 "	2,555
" "	" 25 "	2,737
" "	" 30 "	3,102
Inspector General of		
hospitals and fleets,	" 20 "	3,650
" "	" 25 "	4,106

Besides these rates of pay, (calculated in round numbers, at the rate of four shillings sterling to the dollar,) there are the rates for those retired from active service, widow's pension, &c. After twenty years in the service, every surgeon becomes a staff surgeon, an honorary title only, with augmented pay. Deputy inspectors and inspectors general of hospitals and fleets, correspond in official duty with the surgeons of the fleet in the navy of the United States.

In the English Navy, pursers are termed paymasters. The corps of paymasters are paid nearly, if not exactly, as follows:

Assistant Paymaster, under 4 years service, (2d class,)	\$466
" " above 4 " " (1st class,)	638
" " in charge,	775
Paymaster, 4th class,	1,247
" 3d class,	1,749
" 2d class,	2,372
" 1st class,	3,003

These figures show that the British statesmen place a higher money value upon assistant surgeons, than upon assistant paymasters; upon surgeons than upon paymasters.

Lieutenants are paid about \$1,000 a year; commanders \$1,500; captains \$2,250, \$2,873, \$3,505, according to class, the highest rate being less than that given to the surgeon of the fleet in the English Navy; in which the rates of pay are kept low in order to make the service more acceptable to the aristocracy. The pay of naval cadet and midshipman is so small that they cannot subsist upon it alone, and live consistently with the social position they fill: the annual pay of the naval cadet is \$83, and of the midshipman \$159. It must be evident from these figures that only rich men can afford to permit their sons to enter the British Navy. We ought not to imitate English policy in this respect.

The preceding figures afford sufficient precedent, if that kind of argument be needed, for giving higher rates of compensation to the medical, than to any other staff corps in our naval service.

THE ADULTERATION OF SPIRITUOUS LIQUORS—WHERE IS THE POISON, IN THE PURE, OR IN THE ADULTERATED?

There is a prevalent excitement, and much has been lately said and written, in regard to the adulteration of spirituous liquors. The agitation which once prevailed against the "touching or tasting" of alcoholic drinks, seems now to have subsided and taken up a position in affectionate and earnest defence of the ardent against the *impurities* with which it is said to be contaminated. A change in sentiment has taken place, and it seems now popularly implied, tacitly admitted, or posi-

tively asserted, that "good liquor" is an article possessing in itself no deleterious properties, and which may be habitually imbibed without detriment.

If a dread of the noxious effects of the terrible adulterations which, it is said, are practised with alcoholic liquors, would decrease their consumption, its general credence would aid in relieving the community from the greatest cause of human degradation. But if, while presenting the danger of the factitious additions to alcoholic beverages, the well-known noxious qualities of every kind of liquor which has undergone an alcoholic fermentation or distillation, are overlooked, we will be but shrinking from the shadow of death while the demon itself, in the form of ALCOHOL, will still be invited, as harmless, to the social board.

If alcohol be not the "death in the cup"—if the depraved moral sense, the muddled intellect, the bleared eye, the trembling hands and tottering feet, be not alone the invariable effects of *one* well-known poison to the human mind and frame, it is certainly time that we should seek, in the many adulterations of the drunkard's drink, for the true bane of so much human health and happiness. But the appearances of alcoholic poisoning are too familiarly recognized to be mistaken for the effects of other poisons. Whether the poison be presented in the attractive form of champagne wine, the costliness of grape-brandy, or the cheaper draught of corn-whiskey, alcoholic stimulation is the object sought for, and without which such beverages would be no longer attractive.

The number of substances with which, it is asserted, liquors are adulterated, is enormous, and are said to be of the most virulent or corrosive character. If this were really so, we ought more frequently to see some of the invariable characteristics of poisoning peculiar to the articles said to be used; but, on the contrary, every extreme imbibor of the results of vinous fermentations, no matter in what form presented to please the palate, simply and invariably exhibits, in his mind and body, the bestial expressions of alcoholic poisoning.

The Dispensatory says of alcohol, that "it is the intoxicating ingredient in all spirituous and vinous liquors, including under the latter term, porter, ale, and cider, and every liquid, in short, which has undergone the vinous fermentation. As an article of daily use, alcoholic liquors produce the most deplorable consequences. Besides the moral degradation which they cause, their habitual use gives rise to dyspepsia, hypochondriasis, visceral obstructions, dropsy, paralysis, and not unfrequently, mania."

If such are the melancholy effects of the habitual use on the system of all beverages of an alcoholic character in their *purity*—and the symptoms agree with the experience of every medical man—it would seem unnecessary to seek, in the real or fancied adulterations of liquors, for noxious properties which are clearly and simply connected with alcoholic poisons.

Our attention has been led to the present subject by some popular harangues from a person styling himself "Hiram Cox, M.D., Inspector of Liquors, Cincinnati." However well-meaning may be his efforts in making truly "astounding" disclosures for the intended benefit of the temperance cause, the ignorance displayed and errors stated by him in his sensation speeches, will prevent their accomplishing eventually any real good. As an evidence of the sensation this "inspector" is producing on the public, the following extraordinary account of him, from a daily paper, is presented:

"Strychnine Whiskey Again"—One of our temperance societies has engaged Dr. Hiram Cox, the Cincinnati Inspector of Liquors, to deliver a course of lectures showing up the horrors of the trade in strychnine whiskey. This gentleman was appointed by the authorities of Cincinnati to dive into the grog-shops and liquor stores there, and apply chemical tests to the liquor they had on sale. Though hampered and opposed at every turn, yet he was not to be thwarted. The revelations which followed his investigations were perfectly astounding. They carried consternation even among the drunkards, and so diminished the sale of liquor by proving that nineteen-twentieths of it was deadly poison, that numerous distilleries were closed for want of business, and the liquor dealers besought him to quit, declaring that he had cut down their sales \$1,000,000

per annum. He showed that most of the liquor sold in Cincinnati was so highly charged with deadly acids, that it immediately attacked and corroded a knife blade, and in some cases left on it a coating of copper, as if deposited by a battery. In nearly one thousand stores and grog-shops where he applied the test, he found the liquors adulterated with poisonous ingredients. He mentions a score of young men who have been sent to their graves by less than three months' drinking of this poison. Older men have been killed off by dozens in the same way.

"Two-thirds of all the insane cases in Cincinnati proceed from the same cause, many of them being boys under nineteen years of age. One of them became incurably insane by a single debauch on this adulterated stuff. Much of the liquor inspected contained only seventeen per cent. of alcohol, when it should have contained forty; the rest being represented by sulphuric acid, nitric and prussic acid, nitric ether, fusil oil, nux vomica, Guinea pepper, and other pungent poisons, to give it strength. The compounds Dr. Cox pronounced so deadly that a single pint was sufficient to cause speedy death. These vendors were accordingly prosecuted, punished, and their doggeries closed. The very few who were found to be selling pure liquor were allowed to continue. But the effect of these wholesale exposures on the traffic was most salutary. Thousands immediately quit drinking on learning that nothing but poison was dealt out to them. They will now be repeated here by Dr. Cox himself. Our city needs a purification as much as Cincinnati, as we have thousands of doggeries in which the same rot-gut compounds are sold. Our temperance men intend applying for a law authorizing the appointment of a Chemical Inspector, on the Cincinnati plan, so that if strong drink must be sold among us, it shall at least be the genuine, unadulterated article."

As Dr. Cox seems to be unknown here, excepting from his flashy speeches, we refer for an endorsement of him to the city of which he professes to be the inspector of liquors, and in which he asserts that he has performed such wonders.

The "Druggist," published in Cincinnati, says, in allusion to Dr. Cox's claims:

"We must confess to having a great curiosity to see one of the distilleries which were closed on account of the exposures of the late inspector of liquors of this city, and we would be very much gratified by the sight of a few of the thousands who quit drinking from the same cause. It would also be very gratifying to our feelings to be permitted to

see one of the many stores and grog-shops which were closed, or the vendors who were prosecuted and punished for selling adulterated liquors. And still more gratifying and refreshing would be the sight of one of the few who were found to be selling pure liquor only, and were accordingly allowed to continue.

"Proving the purity of liquors by chemical analysis is a humbug, as every competent chemist knows that only the grossest forms of adulteration can be detected in this way, and the fact of the liquor having been tampered with can be as readily and certainly determined by the taste as by chemical analysis. The more common adulterations, where some pains are taken to imitate good articles, are of such nature as, in the present state of our knowledge, to defy recognition by means of chemical tests.

"With regard to the poisons said to be so commonly present in liquors, it is ridiculous nonsense, or worse, to be taking from the liquors the responsibility for any harm they may do, and putting it on some fancied adulteration.

"As for strychnine, we should have no objection to taking, in one dose, as much of it as Dr. Cox ever obtained from a gallon of Cincinnati whiskey, and should not fear any injury to our health from taking the same amount every day during the rest of our sojourn in this earthly sphere. With regard to the whisky itself, we would not like to venture so much."

The following is what the Doctor thinks of himself. He says:

"An evidence that the exposures which I have been making have had a salutary moral effect, is, that there has not been one-fourth as much liquor sold yearly since as was previously; and another is, that a number of large liquor establishments have closed; their proprietors ruining many of their fellow-citizens who had become their sureties. A number of distilleries have closed in this vicinity. They have, as is familiarly called 'burst their boilers.' One year previous to these break-ups, one of our largest distillers and liquor merchants in the city, said to me, 'Dr. Cox, your articles on the adulterations of liquors, have taken more trade from Cincinnati, and more money—at least \$100,000 per month—since they have been put in circulation. For God's sake, stop them, sir!—you will break us up. I have been to New York, and since to Boston, to Rochester, to Canada West, and have just returned; and wherever I stopped there was nothing talked of but the poisoned liquors of Cincinnati. and Dr. Cox's exposures; for God's sake, I say again, stop it!'"

Here is one of his illustrations of his detection of bad liquor, to the word and letter:

"I asked the landlord to pour me out a little in a tumbler, in which I dipped a slip of litmus paper, which was no sooner wet than it put on a scarlet hue. I went to my office got my instruments and examined it. I found it had 17 per cent. alcoholic spirits by weight, when it should have had 40 per cent. to be proof, and the difference in per centage made up by *Sulphuric Acid, Red Pepper, Pellitory, Costic Potassa and Brucine*, one of the salts of *Nucia Vomica* commonly called *Nux Vomica*.

The most of the articles with which it is said liquors are so extensively adulterated must be in a state of harmless dilution, or their flavor could always be detected, or would make the potation so disagreeable as to be repulsive rather than pleasing to the taste of the tippler. Among them, Dr. Cox says, are strychnia, nux vomica, prussic acid, opium, tobacco, sulphate of copper, aloes, quassia, capsicum, etc. The intensely bitter taste of some of these, as strychnia, would render whiskey repulsive, and the immediate nausea produced by others, as sulphate of copper, would soon make their presence known. In consideration too of the fact that beer and spirit manufacturers and dealers are among the greatest consumers of their own wares, such adulterations seem entirely incredible.

Dr. Cox's favorite test for the adulterations of liquors seems, from the reports of his lectures, to be the evidence of the presence of acid by reddening litmus paper—an effect which would, of course, also be produced if simple lemonade or cider were made the subjects of his experiments. The gaping crowd were, it is supposed, convinced by this test, and one confiding individual, it is reported, asked if a similar cause produced the roseate tint of the toper's nose!

The vice of intemperance is of ancient date, and the scriptural accounts of it show the effects of alcoholic drinks to have been the same of yore, when, it cannot be supposed that the reputed adulterations were practiced, as now.

It is argued in favor of *pure* liquors, that in the vine growing and wine producing countries drunkenness is rare. This is believed to be true, and the evident reason of it is in the

fact that the new wines which are consumed in those regions contain little more alcohol than ordinary cider. The vice of drunkenness prevails most where strongly alcoholic potations are most abundant, as in Ireland, where potato whiskey is distilled, and in this country, where corn is the abundant staple which is transformed in the still.

We are opposed to the habitual consumption of alcoholic beverages, and present our protest against the production, indirectly, of a feeling in favor of them, especially by a medical man, by attempting to shift the responsibility of the evils which they produce on the adulterations with which they are said to be combined.

Without knowing anything of the tricks of the liquor dealers, we are inclined to believe that *water* is the most frequent, because the cheapest adulterant; and, with our present views of the matter, if compelled daily to swallow a certain quantity of ardent spirit in any form, we would choose at a venture that which has been adulterated to that which is assumed to be "pure liquor."

THE PORTRAIT.

It is no easy thing to produce, either with pencil, or with pen and ink, a truthful portrait. The painter or the writer, as the case may be, is too prone to surcharge the canvas or the paper with colors, dark or glaring, according, not only to his own preconceptions of the original, but also to his ideas of artistic rule and exigency. The feelings of the person whom it is desired to compliment on these occasions are not always consulted, by thinking of the taste, judgment, and self-respect which would make him shrink from being the subject of overwrought eulogy, or from being painted in colors too deeply tinted.

We gladly gave room in our columns on March 24th, to a notice of an interesting scene in the amphitheatre of the Medical Department of the University of Pennsylvania. It consisted in the presentation, on the part of the students of the medical class, of a portrait of their professor, Dr. George B. Wood, to the Wistar and Horner Museum, on the occasion of his retirement from his chair in the univer-

sity. We have received since then a copy of the addresses delivered by Dr. J. Campbell Shorb, of Maryland, on the part of the students, and the reply of Dr. R. La Roche, on the part of the trustees. Both of these are couched in a strain of eulogy, the warmth of which, as sympathising friends, we would not think of damping, even though we may, as critics, fear that its effect is somewhat weakened by redundancies. We should like to have seen, in addition, something more of the characteristic features, and of the specific services of the retiring professor, the mental limning, in fine, corresponding with the distinct delineations of the physical features traced by the artist on canvas. On this ground, and in order to show that there is no lack of due appreciation of his merits outside of the university halls, and among those who can not be accused of corporate bias towards an old favorite, or of youthful enthusiasm for a cherished teacher, we give insertion to the following address. It is of course an imaginary one, penned in consequence of an observation made by a friend, and without a knowledge, and in advance of the addresses which were delivered. If it has any advantage over these, it is in exhibiting some of the more distinctive professional and professorial traits of Dr. Wood. The only change from the original draft is in the initial sentence.

The spontaneous offering of young, warm, and generous hearts must ever be received with grateful emotion, even by the most self possessed stoic. Yielding ourselves to this generous feeling, we accept with unfeigned pleasure, from your hands, the portrait of your late professor, Dr. Wood, as expressive both of your respect and esteem for the man, and of your intimate conviction of his peculiar merits as a teacher, whose zeal, learning, and intentionness of purpose have been so long brought into exercise, not less for your instruction than for the benefit of the university. Among the magnates of this institution, he is now by your act formally enrolled. Henceforth, the visitors to the Wistar and Horner Museum, in looking at the features of our venerated friend, which the artist has so successfully depicted on canvas, will call to mind his long career of usefulness and honor, and not without utter-

ing the wish that it were in the power of art to exhibit him, with appropriate attributes, in the successive parts which he has filled as lecturer, physician and author. A gallery of this kind would be full of interest and encouraging example. In its place, the pen will record the early transition from a studious learner to a lucid teacher, in association with his eminent preceptor,¹ who allotted to him the lectureship on Chemistry and Materia Medica to his private class. Next we see him professor, in succession, of the same branches in the College of Pharmacy, and, ere long, succeeding to the chair of Materia Medica and Pharmacy in the University of Pennsylvania. This last he filled with so much distinction and approval, as to create the main cause of hesitation in the minds of the trustees, in giving their consent to his transfer to the chair of the Theory and Practice of Medicine, from a fear that his place might not be as well filled by any of his peers in the profession.

You have enjoyed the opportunities of knowing with what continued skill your professor, in the lecture-room of the University, could combine didactic teaching with demonstrations from models of nearly every form of disease, collected, in a great degree, by his own liberality, and make farther and diversified application of these lessons to bed-side practice, in his lectures on clinical medicine, in the Pennsylvania Hospital.

You leave with us the expressive features of the outward man. You carry with you to your respective homes, for continual company, the more enduring characteristics of the inner one, in his written works on his favorite branches. They will serve as guides, not only in the daily walks, but in the obscure and doubtful passages of your professional life, and, at the same time, as incentives for you to contribute your several shares to the great work of soothing the bodily and mental pains, and saving the lives of your fellow-beings—a great, a glorious mission, the most directly derived by man from his Maker. You will often refer with peculiar interest to one of these works, not alone for its intrinsic value and wide-spread circulation among both physicians and pharmacologists, but as a monument of the united labors of two brothers in science, as they have always been in affection, neither of whom, we believe, it may be safely said, would forego the pleasure of the association, were he sure that a hundred fold addi-

¹ Dr. Joseph Parrish.

tional honor and emolument would ensue from his undivided authorship and possession of copyright.

The life-like portrait of Dr. Wood which is now before us, is true to its original, in the absence of any expression of feature which might indicate even an approach to senility, or a decline of mental vigor. It were, notwithstanding, selfish in us to wish that the University might still continue to enjoy the exercise of his unimpaired powers. Let us rather admire his regulated ambition, and sympathize with his craving for learned leisure and the gratification of refined tastes, during a long remaining period, which we will fondly and not unreasonably hope may equal the age of the almost octogenarian Cullen, the great Scotch teacher and writer, who, from his having been successively, Professor of Chemistry, *Materia Medica*, and the Practice of Medicine, should be ranked as a worthy prototype of our retiring professor.

News and Miscellany.

The Operation for Vesico Vaginal Fistula in Paris.—Dr. Battey says, in a letter to the *Atlanta Medical and Surgical Journal*, that, upon one of his clinic days, "Nélaton essayed the performance of Bozeman's operation for vesico-vaginal fistula—worked for two hours, as I am informed, very industriously in the location of three points of suture, and left the case finally in a condition which he acknowledged to be quite unsatisfactory. A cure was not anticipated, but what the result was, I have not yet learned. Nélaton is unquestionably a superior operating surgeon—perhaps has no successful rival in Paris—but seems, like all Parisian surgeons, to encounter special difficulties in this essentially American operation."

The complications of the operation in the manner probably attempted by the French surgeon, were, it may be supposed, the cause of the apparent awkwardness and delay. We have seen the operation successfully performed by simply uniting with the all-sufficient wire-suture, without the least haste, in thirty minutes, and suppose that in very favorable cases much less time would be required.

Mr. Van Voorst, of London, has in press "The Posthumous Papers of JOHN HUNTER on Natural History, Physiology, Generation, Psychology, Palæontology, and Comparative

Anatomy." Edited with notes, by Prof. Owen.

Army News.—Leave of absence for thirty days has been granted to Assistant Surgeon R. H. Alexander, Medical Department.

Assistant Surgeon G. E. Cooper has been ordered to report on or before the 25th inst., to the commanding officer of Fort Monroe, for duty at that post during the temporary absence of Surgeon J. M. Cuyler, a member of the Medical Board appointed to meet in the city of New York the 1st of May. On the return of Surgeon Cuyler to his station, Assistant Surgeon Cooper has been authorized to avail himself of the unexpired leave of absence heretofore granted to him.

The following Medical Officers have been assigned to duty at the posts set opposite their respective names, viz.:

Assistant Surgeon N. S. Crowell, to Fort Yuma, Cal.

Assistant Surgeon J. C. Herndon, to Fort Mohave, N. M.

Assistant Surgeon J. J. Milhau, to Fort Umpqua, Oregon.

Assistant Surgeon R. F. Simpson, now on leave of absence, has been ordered to repair to Fort Ridgely, Minnesota, on or before the 1st of May next, and report for duty at that post.

Assistant Surgeon C. H. Smith, now on duty in Texas, has been ordered to report on the 1st of May next, or as soon thereafter as practicable, to Surgeon C. A. Finley, President of the Medical Board appointed to meet in the city of New York, for examination for promotion.

Assistant Surgeon L. H. Stone has been ordered to repair, on the 7th of May next, to the city of New York, and report to Surgeon C. A. Finley, President of the Medical Board for examination for promotion.

A Naval Medical Board for the examination of candidates for admission into the medical staff of the Navy, is in daily session at the Naval Asylum in this city. It consists of Surgeons Jas. M. Green, (President), W. S. W. Ruschenberger, Joseph Wilson, Jr., and Passed Assistant Surgeon Albert Schriver, (Recorder.)

Dr. Windship, of Boston, who is well known on account of his extraordinary development of physical strength, is now lecturing on Physical Culture in this city, in connection with Hillebrand's and Lewis' gymnastic establishment.